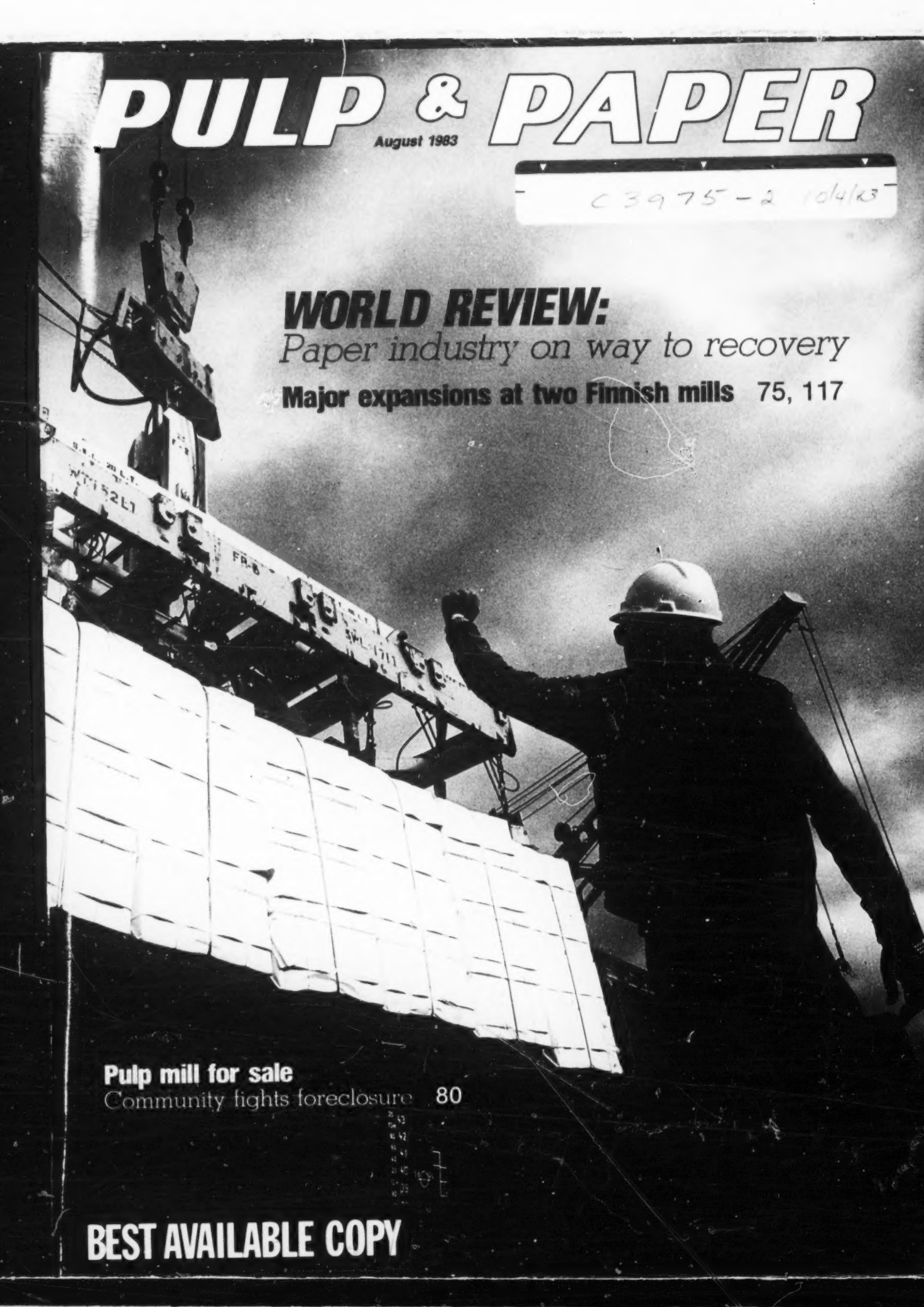


PULP & PAPER



August 1983

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WORLD REVIEW:

Paper industry on way to recovery

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COVER: Pulp produced at three Georgia-Pacific mills being loaded on board for export to overseas markets. (Photo courtesy Georgia-Pacific.)

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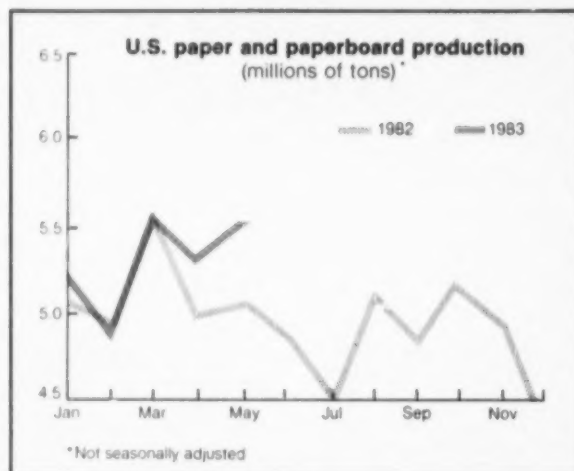
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MONTH IN STATISTICS

U.S. PAPER AND PAPERBOARD PRODUCTION in May totaled 5,541 million short tons, up 10.6% over year-earlier levels, according to the American Paper Institute. The May output level was the second highest monthly total, exceeded only by the 5,595 million tons produced in March 1981. The April-May two-month moving average of seasonally adjusted data on paper and paperboard production was at 62.8 million tpy, compared with the 61.9 million tpy during January-April.

Among major grades, the strongest growth trends continued in the printing/writing paper grades, with uncoated free sheet and coated paper showing particular strength. Paperboard production in May was about 5% over year-ago rates, with major strength in containerboard production for domestic use, which gained 5.4%, and paperboard production for export, up 8.5%. The Fibre Box Assn. reported fiber box shipments in April and May moved sharply above their first-quarter levels.

Canadian newsprint shipments totaled 683,000 metric tons in May, down 4.9% from a year ago, according to the Canadian Pulp & Paper Assn. Newsprint mill operating rates were 85% in May compared with 88% a year earlier.



	Latest month (000 short tons)	% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
--	----------------------------------	------------------------------	--	------------------------------

PAPER & PAPERBOARD PRODUCTION¹

Newsprint	May	440	3.8	5,159	-2.2
Uncoated groundwood (s)	May	133	14.7	1,458	3.1
Coated paper (s)	May	462	13.0	5,369	9.3
Uncoated free sheet (s)	May	733	14.7	8,634	9.2
Unbleached kraft packaging and industrial (s)	May	304	12.2	3,717	-0.4
Tissue	May	405	11.3	4,708	5.7
Total paper	May	2,754	12.2	32,223	5.0
Kraft linerboard, unbleached	May	1,318	11.7	14,788	7.1
Semichemical medium	May	415	9.2	4,614	2.6
Bleached paperboard	May	342	4.0	3,923	2.7
Recycled paperboard	May	617	9.2	7,063	5.2
Total paperboard	May	2,787	9.1	31,428	4.9
Total paper and paperboard²	May	5,541	10.6	63,651	5.0

PULP, WASTEPAPER & FIBER²

Total woodpulp production	April	4,280	1.7	51,419	0.7
Market pulp production	April	537	8.7	6,140	2.1
Wastepaper consumption at paper/board mills	April	1,164	0.6	14,094	3.8
Pulpwood consumption (cords)	May	7,162	5.5	84,864	5.9

CONVERTED PRODUCTS STATISTICS³

Corrugated box shipments (billion ft ³)	May	20,777	10.7	101,829†	4.4
Containerboard inventories at box plants	May 1	2,495	-6.1		

INTERNATIONAL TRADE²

U.S. paper imports (including products)	April	699	16.5	8,185	4.9
Imports of Canadian newsprint	April	527	5.4	6,337†	-4.3
U.S. paper exports (including products)	April	392	14.3	4,412	6.4
Exports of unbleached kraft linerboard	May	203	12.2	2,207	10.6
Exports of woodpulp	April	346	9.5	3,548	2.0

CANADIAN STATISTICS⁴ (reported in metric tons)

Total newsprint shipments	May	683	-4.9	3,280†	-7.1
Operating rates	May	85%	88%	82%	91%
Inventories held by U.S. consumers	May 31	1,182	-26.1		
Woodpulp shipments (export only)	May	526	2.3	2,573†	4.1
Operating rates	May	79%	81%	79%	85%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. Canadian Pulp & Paper Assn.
*Includes construction and wet machine grades. †Not annualized. ‡Not directly comparable to year ago because of coding change. (s) = shipments.

CFI completes boiler conversion

Two power boilers at Continental Forest Industries Inc.'s Augusta, Ga., bleached board mill have been converted to multifuel boilers, the company announced. As a result of the \$30-million project, Nos. 1 and 2 boilers will burn about 250,000 tpy of coal, saving the equivalent of 1 million bbl/year of oil. Both boilers could still burn oil or gas.

The new coal-handling system, completely enclosed, has four coal silos, each with a 1,600-tpd capacity, constructed by First Colony. Coal-firing equipment was supplied by Babcock & Wilcox, original manufacturers of the boiler.

SHUTDOWN

Durham closes recycled liner mill

Durham Mills Inc. has indefinitely idled its Durham, Pa., 375-tpd recycled linerboard mill due to "substantial losses." But the mill, which closed effective June 18, is expected to come back online within one to six months depending on the company's success in finding additional investors and improvement in markets.

Heavy financial losses were incurred as a result of "rapid escalation of wastepaper prices which we were unable to cover in the sales price," the company noted. Earlier this year Durham appointed Perry H. Koplik & Sons Inc. as agent to market the mill's "Metro-Linerboard" (basis weights 38 and 42 lb) to the northeast corrugated box industry.

Partners in the Durham mill purchased last year from bankrupt Whippany Paper Board include: Connecticut Container Corp. of North Haven, Conn.; Star Corrugated Box Co. of Maspeth, N.Y.; and Greater New York Box, of Clifton, N.J.

CAPITAL SPENDING

1983 capital spending up in U.S.

Betting on continued recovery in the economy, U.S. paper-makers are still planning a slight increase in 1983 capital spending, despite the fact that profits are just beginning to revive. The latest Commerce Dept. survey shows that the industry expects to lift outlays for new plant and equipment by 1.0% to \$6.03 billion in 1983, while a recent McGraw-Hill

survey reports that the paper industry is planning an even stronger 6.3% increase in outlays to \$6.34 billion. This would reverse a two-year decline in which spending fell from a 1980 peak of \$6.8 billion to \$5.97 billion last year.

But faced with a slow recovery in export markets, overcapacity in newsprint and heavy debt loads, Canadian producers plan to reduce capital spending by 41.8% in 1983 to C\$1.07 billion, according to a Statistics Canada survey completed early this year. This would follow a 16.1% drop last year to \$1.83 billion from the 1981 peak of \$2.18 billion.

U.S. spending pickup. According to the Commerce survey, U.S. paper industry spending is expected to decline from a seasonally adjusted annual rate of \$6.02 billion in the first quarter of 1983 to a low in the second quarter of \$5.84 billion, and then jump to \$6.10 billion in the third and \$6.17 billion in the fourth quarter. Actual spending for 1983 could turn out higher since plans are normally revised upward as an economic recovery gathers steam.

In contrast to the slight rise in paper industry capital spending, U.S. business as a whole plans to reduce outlays by 3.4% in 1983, after a 1.6% decline in 1982. The decline in real spending would be somewhat less since capital goods prices are expected to decline 0.4% this year.

Major projects. Overall U.S. paper industry spending levels are being helped by several major projects—new greenfield mills being built by Great Northern Nekoosa and Union Camp Corp. and International Paper's modernization of its Georgetown, S.C., mill. IP plans to boost spending by 62% this year, while increases of around 35% are planned by GNN and Union Camp. Also buoying spending totals are continued heavy outlays on projects to reduce energy costs, such as multifuel boilers to replace older oil-and-gas-fired units. In addition, environmental spending is expected to rise sharply in 1983, reversing a declining trend.

According to McGraw-Hill's survey, U.S. paper industry spending this year will be divided equally between "expansion" and "replacement/modernization." About 89% of outlays will go for machinery and equipment, 9% for buildings and 2% for motor vehicles. (Continued on p. 33)

Complete listings of mill downtime taken in 1982

and in the first and second quarters of 1983 are now available for purchase. The reports list facilities alphabetically and by company and grade categories. *Pulp & Paper* does not guarantee the accuracy or completeness of the reports, which can be purchased for \$45 for the 1982 report, and \$15 for each of the quarterly reports. For listings, send a check payable to *Pulp & Paper*, 500 Howard St., San Francisco, Calif., 94105.

**North American paper industry
capital spending estimates for 1983**
(billions of \$)

United States	1983e	1982	1981	% change 1983/82
Commerce Dept (Apr./May) ¹				
Paper & allied	\$6.03	\$5.97	\$6.72	+1.0%
All manufactur-				
ing	112.79	119.68	126.79	-5.8
McGraw-Hill (Mar./Apr.)				
Paper & Pulp ²	6.34	5.97	6.72	+6.3
All manufactur-				
ing	117.74	119.68	126.79	-1.6
Canada				
Statistics Canada (Dec./Jan.)				
Paper & allied ³	C\$1.07	C\$1.83	C\$2.18	-41.8
All manufactur-				
ing ³	9.10	11.12	12.74	-18.2

¹When survey conducted.

²Excludes repair expenditures.

The survey reports preliminary paper industry capital spending plans of \$5.4 billion in 1984 and \$7.0 billion in 1985. The 15% decline next year from 1983's level may reflect completion of major projects but will probably prove low if the recovery continues. The Commerce survey found that the industry planned to boost outlays for new plant and equipment to abate pollution by 43% to \$430 million from \$300 million in 1982. McGraw-Hill's survey showed that the industry was planning an even sharper 75.7% boost in pollution control spending to \$550 million from \$313 million in 1982.

Canadian slump. The size of the decline in Canadian paper industry capital spending was not unexpected, given the poor profit performance of most companies, particularly in western Canada. Outlays this year are expected to drop 72.6% to C\$120.2 million in British Columbia, 44.0% to C\$314.6 million in Ontario and 20.9% to C\$365.1 million in Quebec.

Of total Canadian paper industry capital spending of C\$1.06 billion, 13.5% will be for construction and 86.5% for machinery and equipment. Not included in this total is nearly C\$1 billion in noncapitalized repair spending, which will be up 8.6% from a year ago.

ENVIRONMENT

API/NFPA announce awards

Winners of the industry's 10th annual environmental and energy achievement awards were announced at the American Paper Institute/National Forest Products Assn. Environmental Forum meeting June 1-3 in Washington, D.C. An independent jury of experts selected the following winners:

• **Water pollution control.** Buckeye Cellulose Corp. received this award for its new 300,000-tpy bleached kraft pulp mill at Oglethorpe, Ga., said to have the lowest biological oxygen demand (BOD) and color per ton of pulp of any mill in North America.

Use of oxygen delignification followed by three-stage D/CED bleaching results in a 30% to 35% reduction in untreated waste BOD vs a conventional kraft process. The combination of the oxygen stage and bleaching with a high level of chlorine dioxide substitution produces less than half the color of a typical bleached kraft plant. Further color reduction is achieved by adding oxygen to the extraction stage. Extensive internal recycling minimizes the water sent to treatment.

Last year effluent color averaged less than 125 lb of equivalent platinum cobalt units/ton of pulp, compared with 400 to 600 for a typical bleached kraft process. Water usage averaged 14,000 gal/ton, compared with 40,000 for a typical plant. Untreated BOD averaged 45 lb/ton with an average removal efficiency of 95%, compared with typical plant performance of 60 to 80 lb/ton with less than 90% removal. As a result, BOD at the plant averaged 2.3 lb/ton, well within Buckeye's permit limit of 5.3 lb/ton (about half the federal new source performance standard of 11.0). Suspendable solids and pH were also within federal/state limits.

• **Energy innovation.** Georgia-Pacific Corp. received the

award for installation of a new horizontal belt washer on a hardwood kraft pulp line at its Crossett, Ark., mill. Purpose of the project was to achieve high washing efficiency at low dilution rates, improving energy efficiency.

Compared with a conventional washer, however, the new Crossett washer has achieved the following results: (1) Weak black liquor solids have increased from 13.5% to 18.9%, reducing boiler fuel consumption 1.6 million Btu/a.d. ton of pulp—a \$2-million annual natural gas savings; (2) Filtrate pulping requirements were reduced an estimated 10 kWh/ton, with an electricity cost savings of \$90,000/year; (3) Increased washing efficiency reduced brownstock washer chemical losses and consequent saltcake makeup from 25 to 20 lb/ton, resulting in a \$130,000/year chemical savings.

• **Air pollution control.** Crown Zellerbach Corp. earned the award for its control of nitrogen oxide emissions from a combined-cycle cogeneration system at its Antioch, Calif., recycled paperboard mill. The new system had to meet the lowest achievable emission rate requirement of 42 ppm NO_x exhaust concentration—never before achieved by a large industrial cogeneration system.

Included are a General Electric 32-MW gas turbine and a supplementally fired heat recovery steam generator. The project can produce up to 47 MW of electrical power using an existing 12-MW extraction/condensing steam turbine and supplies 260,000 lb/hour of steam. The NO_x emission control is achieved via steam injection and specially designed low NO_x combustion liners. Higher efficiency and power sales resulted in a 30% to 50% reduction in mill power cost per unit of production.

• **Energy management.** Scott Paper Co.'s S.D. Warren Div. received the award for an \$85-million biomass power project completed at its Westbrook, Maine, mill in 1982. The cogeneration project includes a high-pressure boiler capable of burning both low-cost woodwaste and coal to produce 650,000 lb/hour of steam.

Replacing five older, less efficient oil-fired boilers, the project has eliminated use of over 700,000 bbl/year of imported oil and reduced energy cost per ton by 65%, restoring profitability and ensuring future operation of the 104-year-old facility. Local air quality has also improved, with sulfur dioxide and particulate emissions cut to about one-quarter of their former level.

• **Forest management.** Westvaco Corp. was the recipient of the award for a forest research program which included construction of a laboratory at its Summerville, S.C., forestry center in 1982 to research technology in forest tree improvement, biometrics, tree physiology, soils and hardwood management. Field laboratories were also added at Rupert, W.Va., and Wickliffe, Ky., for a total investment of more than \$4 million. Total staff was increased to 58. Westvaco's research promises to increase future supplies of wood from the company's own land holdings and augment basic knowledge of forest biology in the eastern U.S.

• **Solid waste management.** Owens-Illinois Inc. won the award for developing an approved retrofit system of protecting groundwater quality against contamination from a long-established sludge landfill. The system at its Tomahawk, Wis., mill is based on geotechnical exploration and modeling, and makes use of a novel water flow containment plan.

Bleached paperboard: Low capacity growth will lead to high operating rates

Statistics	1981	1982	1983e
Production, 000 tons	3,910	3,665	3,775
Capacity, 000 tons ¹	4,141	4,184	4,198
Utilization rate, %	94.4	87.6	89.9
Imports, 000 tons	—	—	—
Exports, 000 tons ²	557	525	570
Apparent U.S. consumption			
000 tons	3,353	3,140	27.36
lb/capita	29.18	27.07	3,205
000 tons/\$billion real GNP (1972)	2.23	2.13	2.14

1. Because of grade switching, capacity utilization is difficult to define.

2. API production for export.

Grade structure: Solid bleached sulfate (SBS) paperboard is primarily used for folding carton and milk carton stock. Smaller amounts are used for cups, plates, and trays and for linerboard. Bleached boards are made in a range of calipers, typically 10 to 28 pt, and in three levels of density—low, medium and high. About 50% of the tonnage is coated. Basis weights vary between 120 and 300 lb/3,000 ft².

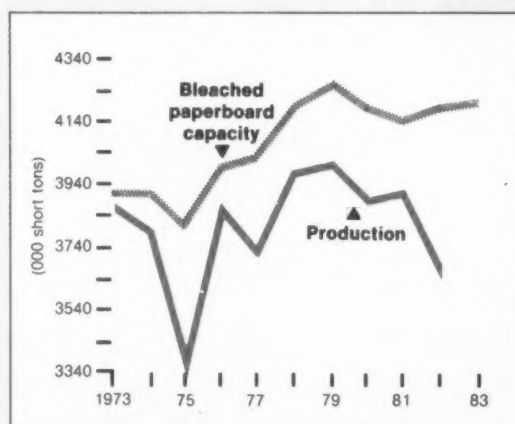
Production capacity. Bleached board production dropped sharply in 1982 by 6.3%, to 3.67 million tons after a small rise of 2.1%, to 3.91 million tons in 1981. As a result, operating rates declined from 94.4% in 1981 to 87.6% last year, their lowest level since the 1974-75 recession. Exports also dropped 10% in 1982 to 525,000 tons due to the world recession and strong U.S. dollar.

The decline in operating rates occurred last year despite the fact that capacity rose only 1% to 4.18 million tons. Industry capacity for SBS is difficult to define since some machines can produce bristols, board, and market and fluff pulps. Some capacity last year was swung into production of roll pulp and contributed to the sharp drop in bleached board production.

Outlook. Operating rates for SBS should be among the highest for any grade in the paper industry during the next several years mainly due to limited capacity growth.

Capacity is expected to remain relatively flat this year and through 1985 is expected to rise only 61,000 tons, to 4.25 million tons. International Paper Co. has plans to add about 150,000 tpy of capacity through 1985 by the reconfiguration of its Georgetown, S.C., mill, which will permit more SBS to be produced at its Texarkana, Texas, facility, and through a possible expansion of its Pine Bluff, Ark., mill. Small incremental capacity increases are planned by some other producers and some production could also be shifted from market pulp to bleached board production.

Production is projected to rise about 3% in 1983 and to average at least 2% over the next several years. Folding carton demand is expected to increase by about 2%/year, while domestic milk carton demand may be bottoming out after having declined about 5%/year in recent years due to plastic penetration in half-gallon containers and lower per capita milk consumption. Domestic demand for SBS is also expected to benefit from such new developments as ovenable board and aseptic packaging. But further plastic penetration into half-gallon-size milk cartons and food service disposables



Estimated capacities of major U.S. companies are:

	Annual capacity (000 tons)	Capacity share (%)
1. International Paper	950	22.6
2. Potlatch	500	11.9
3. Westvaco	410	9.8
4. Continental Forest Industries	370	8.8
5. Federal Paper Board	330	7.9
6. Temple-Eastex	310	7.4
7. Champion International	265	6.3
8. James River	209	5.0
9. Weyerhaeuser	200	4.8
10. Gulf States Paper	180	4.3
11. Container Corp. of America	170	4.0
12. Gilman Paper	160	3.8
13. Georgia-Pacific	150	3.6

U.S. capacity (1983): 4,198 million short tons
Capacity share of top five companies: 61.0%
Capacity share of top ten companies: 88.8%

(cups, trays, plates) remains a threat.

Export shipments of SBS are expected to resume their high rate of growth, increasing demand for milk carton stock in such markets as Japan, Asia/Oceania, and Latin America.

As a result of overall growth in demand and limited capacity addition, operating rates should rise from around 90% this year to 92% to 93% in 1984, and 95% to 96% in 1985. This should permit producers to pass through price increases and improve profit margins.

Pricing: List prices for SBS folding carton stock dropped from \$625/ton late last year to \$590, wiping out a July 1982 price increase. The drop was due to weakening demand and increasing price competition from clay-coated recycled paperboard mills, which benefitted during the recession from a sharp decline in wastepaper costs. Several producers failed in an attempt to raise prices last spring but another move to return prices to their former list level is likely later this year.

Approximate price history for 15-pt coated SBS folding carton board in \$/short ton at year-end: 1973, \$250; 1974, \$350; 1975, \$355; 1976, \$385; 1977, \$405; 1978, \$445; 1979, \$490; 1980, \$518; 1981, \$625; 1982, \$590; 1983e, \$625.

WORLD PULP/PAPER INDUSTRY: decline in '82, but hope in '83

Output of pulp and paper decreased in 1982; markets for newsprint and pulp were especially weak; but some Asian and other nations did well

By PETER SUTTON, DAVE O'DONOGHUE, and JOHN KALISH,
 International Editors

■ Many countries around the world report that 1982 was a difficult year, with sluggish domestic demand and oversupplied international markets. For the first time since the slump of 1975, world paper and board production dropped below the previous year. The 1982 total was 166.5 million tons, down 2% from 1981. World pulp output fared even worse, dropping 4.2% to 123.8 million tons.

With world paper and board consumption at 165.8 million tons in 1982, down nearly 2%, few major producers escaped from falling demand. In Western Europe, only four of the 16 paper-producing countries recorded an increase in 1982 output over 1981. And none of the four was a Scandinavian country. The U.S., Canada, Brazil and New Zealand also saw output fall.

Countries in Asia and the southern hemisphere reported a more satisfactory year. Japan's paper and board production went up nearly 500,000 tons in 1982, and People's Rep. of China, India and Taiwan all had increased output. Of the five big producers in the Far East, only Rep. of Korea reported a drop in production—for the first time in that country's history. South Africa, Australia and Mexico, all making more than 1 million tpy of paper and board, also increased output in 1982. In Eastern Europe, total 1982 production showed an increase over 1981.

NEWSPRINT MILLS HIT. Industry overcapacity and the resulting low operating rates affected mills supply-

ing the main international markets. While newsprint production in Western Europe followed the trend of recent years (down 150,000 tons in the EEC and up 100,000 tons in Scandinavia), North American—mostly Canadian—newsprint producers were hurt by the drop in demand and in prices. Around the world, mills made 1 million tons less newsprint in 1982 than in 1981.

In general, the other major paper and board markets had a marginally better year than newsprint, though for some it was a mixed result. For example, although the U.S. **linerboard** market had its severest downturn in 1982 since 1949, major European suppliers, such as the Swedes, had a good year—partly due to the high dollar-exchange rate. In Asia's linerboard markets, some nations were imposing strict import controls, but the consumer markets of Singapore and Hong Kong began to firm up during the year.

Of the other major grades, production of **printing/writing papers** held up well around the world, particularly in Asia, and ended the year at about the same level as in 1981—41.5 million tons. Reports from many countries confirm that, in general, paperboard producers had a very difficult 1982.

Following a year that many producers would like to forget, 1983 started off with signs of economic upturn in U.S., setting a generally more optimistic mood. Paper demand increased in Western Europe in the early part of the year, but by midyear the growth in demand had leveled off. Although few of the major producers expect any dramatic improvement in 1983, there is the view that paper and board markets—with the exception of newsprint—are slowly on the way up.

PULP MARKET PROBLEMS. If 1982 was a bad year for the paper mills, it was a near disaster for the pulp suppliers. The report for chemical pulp production in 1982 is nearly 4 million tons below 1981. In round figures, Scandinavia produced 1 million tons less, and North America 3 million tons less. Average operating rate of the Norscan market pulp mills, the main suppliers to the world, dropped 10.5 points from 1981 down to 76.7%. The trend of falling world prices and of paper mills trimming pulp stocks to a minimum continued through 1982.

The poor pulp market accentuated the buying trend toward the cheaper hardwood market pulps and away

* In this review, data from all countries, including U.S., are reported in metric tons. All data conform with FAO definitions: thus, paper/board totals do not include insulation board; pulp figures exclude screenings, defibrated, and exploded pulps.

Production by continents, world total (000 metric tons)

PULP						PAPER AND PAPERBOARD					
	1960	1970	1980	1981	1982		1960	1970	1980	1981	1982
North America	32,964	54,912	65,969	66,496	61,774	North America	38,917	58,914	70,225	70,098	66,539
Europe	20,965	34,853	40,235	39,945	38,577	Europe	25,634	45,159	59,023	59,140	58,217
Asia/Australasia	5,156	14,268	18,239	16,404	16,611	Asia/Australasia	7,861	20,621	31,962	31,137	32,332
Latin America	821	2,224	5,848	5,166	5,162	Latin America	1,656	3,712	7,737	7,583	7,582
Africa	124	900	1,502	1,648	1,698	Africa	288	892	1,717	1,843	1,848
World total	60,031	107,157	131,793	129,659	123,822	World total	74,355	129,298	170,864	169,801	166,518

World's top 20 producing and consuming countries

PAPER AND BOARD PRODUCTION (000 tons)			PULP PRODUCTION (000 tons)			PER CAPITA CONSUMPTION (lb/year)		
	1982	1981		1982	1981		1982	1981
1. USA	54,132	56,495	1. USA	44,786	47,211	1. USA	551	591
2. Japan	17,452	16,980	2. Canada	16,988	19,285	2. Sweden	445	441
3. Canada	12,406	13,603	3. USSR	9,160	9,060	3. Canada	386	434
4. USSR	9,077	8,955	4. Japan	8,626	8,612	4. Denmark	366	359
5. Germany, Fed. Rep.	7,779	7,828	5. Sweden	7,706	8,529	5. Finland	353	437
6. Sweden	5,928	6,136	6. Finland	6,714	7,331	6. Switzerland	344	366
7. Finland	5,895	6,135	7. China	4,582	4,310	7. Germany, Fed. Rep.	335	346
8. China	5,890	5,400	8. Brazil	2,912	2,910	8. Netherlands	335	340
9. France	5,127	5,148	9. Germany, Fed. Rep.	2,004	2,021	9. Japan	322	315
10. Italy	4,571	4,852	10. France	1,765	1,715	10. Belgium	315	311
11. Brazil	3,244	3,297	11. Norway	1,522	1,608	11. New Zealand	315	298
12. UK	3,124	3,379	12. Spain	1,350	1,354	12. Australia	298	302
13. Spain	2,685	2,588	13. Austria	1,189	1,210	13. Norway	287	311
14. Mexico	1,987	1,950	14. South Africa	1,165	1,122	14. UK	262	273
15. Korea, Rep.	1,737	1,783	15. New Zealand	1,060	1,160	15. France	258	254
16. Austria	1,707	1,671	16. Czechoslovakia	960	880	16. Austria	229	238
17. Netherlands	1,633	1,683	17. Portugal	952	895	17. Iceland	198	201
18. Taiwan	1,556	1,498	18. Italy	816	962	18. Ireland	194	205
19. Australia	1,496	1,394	19. Romania	815	815	19. Italy	192	192
20. Norway	1,304	1,373	20. Mexico	748	743	20. Taiwan	192	172

REVIEW OF TOP 25 PAPER- AND PULP-PRODUCING NATIONS

Abridged data on production and export/import trade are given for countries included in the Top 20 tables for paper and board production and for pulp production.

Australia

Population: 15,170,000. Per capita consumption of paper and board: 135 kg/298 lb. Number of paper and board mills: 16. Number of pulp mills: 17 (sulfate: 1; sulfite: 1; soda: 2; semichemical: 4; mechanical: 8; nonwood: 1).

Paper/board capacity: 1,745,000e tons **Pulp capacity:** 1,000,000 tons

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	442	548	545	432	13	14
Board	951	948	208	196	79	61
Total	1,393	1,496	753	628	92	75
Chemical woodpulp	445	479	252	241	—	—
Other pulps	218	226	2	1	—	—
Total	663	705	254	242	—	—

Austria

Population: 7,570,000. Per capita consumption of paper and board: 104 kg/229 lb. Number of paper and board mills: 36. Number of pulp mills: 21 (sulfate: 2; sulfite: 8; semichemical: 1; mechanical: 10).

Paper/board capacity: 2,006,000 tons **Pulp capacity:** 1,358,000 tons
Operating rate 1982: 85% **Operating rate 1982:** 88%

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	935	961	111	177	610	628
Board	736	746	95	84	440	471
Total	1,671	1,707	206	211	1,050	1,099
Chemical woodpulp	861	853	186	183	250	221
Other pulps	349	336	15	18	12	12
Total	1,210	1,189	201	201	262	233

Brazil

Population: 124,000,000. Per capita consumption of paper and board: 27 kg/60 lb. Number of paper and board mills: 160. Number of pulp mills: 48.

Paper/board capacity: 4,000,000 tons **Pulp capacity:** 3,990,000 tons

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	2,062	2,110	234	249	219	193
Board	1,228	1,134	—	—	78	54
Total	3,290	3,244	234	249	297	247
Chemical woodpulp	2,910	2,912	15	12	769	810
Other pulps	n.a.	n.a.	6	1	—	—
Total	2,910	2,912	21	13	769	810

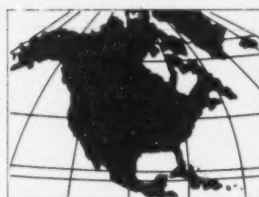
from top-price bleached softwoods. While pulp exports of the Nordic countries and North America fell in 1982, exports from Brazil and Portugal, two key hardwood pulp suppliers, increased.

Expansion/modernization projects have understandably been affected by the state of the economy. However, an additional 10.1 million metric tons of paper and board is expected to be added to worldwide capacity by 1986 in "firm" capital spending programs reported in the *PPI Capital Investment Survey 1983-86*. A further 3.9 million tons is in advanced planning stages.

Additions to pulp capacity in the 1983-86 period will total 9.4 million tons from firm projects and 2.9 million tons in advanced planning, reports the *PPI* survey.

RELIEF IN 1983. Early 1983 brought some relief to the pulp market. With an increase in paper demand pushing heavy restocking by paper mills, the first price rise of bleached softwood kraft pulp in over a year was attempted in Western Europe. By mid-1983 it had yet to be fully accepted by buyers, but it seemed likely it would eventually be successful. Suppliers to the U.S. market were content to firm up to the list price, preparing for a probable large price increase in fourth-quarter 1983. Throughout the early part of the year, the international hardwood pulp market was considerably tighter than softwood, and not only did suppliers succeed with one price increase, but some also attempted a second for the third quarter.

General consensus at midyear was that the pulp and paper industry—following the world economy—had begun to head out of the recession into a period of recovery. Opinions varied widely on the rate of this recovery, with some regions—such as Asia and Latin America—seeming likely to see more rapid growth than others.



NORTH AMERICA

IN 1982, THE NORTH American pulp and paper industry experienced a very weak year: production slumped sharply in both the U.S. and Canada, and corporate profitability suffered.

Total North American paper and board output dropped by 5.6% to 66.5 million metric tons. Canada recorded the sharper decline, down almost 9% to 12.4 million tons, as newsprint producers were caught in the crunch of heavy competition for the traditional U.S. market and general sluggishness in overseas markets.

The operating rate for **Canada's** newsprint mills fell dramatically from 94% in 1981 to 82% in 1982, while the operating rate for all paper and board fell to 80%. For market pulp mills, the situation was even worse as operating rates fell 11 points to 77% for 1982's average.

Fortunately with the recovery now underway, both newsprint and market pulp sectors are expected to recover to an 83% operating rate in 1983, according to Canadian Pulp & Paper Assn.

Operating rates fared somewhat better in 1982 in the U.S., being about five points higher for both paper/board and market pulp. In the latter case, the strength of U.S. southern pulps helped offset some of the general weakness of the recession.

Capital investment. Much of the capital spending in **Canada** is aimed at restoring competitive ability and replacing older equipment, although some additional capacity is involved in most cases. Typical is Abitibi-

Canada

Population: 24,600,000. Per capita consumption of paper and board: 175 kg/386 lb. Number of paper and board mills: 107. Number of pulp mills: 34.

Paper/board capacity: 15,269,000 tons
Operating rate 1982: —%

Pulpcapacity: 23,165,000 tons
Operating rate 1982: 76%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	11,256	10,423	334	225	8,755	8,073
Board	2,347	1,983	111	136	440	384
Total	13,603	12,406	445	361	9,195	8,457
Chemical woodpulp	11,380	9,257	75	87	6,084	5,372
Other pulps	7,905	7,031	60	52	515	491
Total	19,285	16,988	135	139	6,599	5,863

China, People's Rep. of

Population: 1,015,410,000. Per capita consumption of paper and board: 6.3e kg/14 lb. Number of paper and board mills: 1,600e.

Paper/board capacity: 6,850,000 tons

Pulp capacity: 5,970,000 tons

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	3,260	3,233	217	—	117	—
Board	2,140	2,657	492	—	75	—
Total	5,400	5,890	709	—	192	—
Chemical woodpulp	740	760	590	—	0	—
Other pulps	3,570	3,822	64	—	0	—
Total	4,310	4,582	654	—	0	—

Czechoslovakia

Population: 15,520,000. Per capita consumption of paper and board: 76 kg/168 lb. Number of paper and board mills: 49. Number of pulp mills: 24 (sulfate: 5; sulfite: 7; semichemical: 1; mechanical: 10; nonwood: 1).

Paper/board capacity: 1,282,000 tons
Operating rate 1982: 97%

Pulp capacity: 1,031,000 tons
Operating rate 1982: 93%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	687	708	48	43	112	92
Board	539	541	75	84	80	100
Total	1,226	1,249	123	127	192	192
Chemical woodpulp	645	727	84	56	9	66
Other pulps	235	233	26	29	4	3
Total	880	960	110	85	13	69

Finland

Population: 4,830,000. Per capita consumption of paper and board: 160 kg/353 lb. Number of paper and board mills: 46. Number of pulp mills: 51 (sulfate: 18; sulfite: 8; semichemical: 3; mechanical: 22).

Paper/board capacity: 7,135,000 tons

Pulp capacity: 8,550,000 tons

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	4,618	4,444	13	14	3,694	3,664
Board	1,517	1,451	29	28	1,141	1,168
Total	6,135	5,895	42	42	4,835	4,832
Chemical woodpulp	4,545	4,103	8	10	1,494	1,278
Other pulps	2,786	2,611	28	45	191	179
Total	7,331	6,714	36	55	1,685	1,457

WORLD PULP, PAPER, AND BOARD

EUROPE	Population (1,000)	Number of mills		Capacity (1,000 m tons)		Per Capita (lb)	Consumption (1,000 tons)				Production (1,000 m tons)			
		P&B	Pulp	P&B	Pulp		P&B		Pulp		P&B		Pulp	
							1981	1982	1981	1982	1981	1982	1981	1982
Belgium	9,900	16	3	925	400	315	1,391	1,412	592	586	887	328	337	322
Denmark	5,120	6	3	318	130	366	842	850	165	154	266	279	117	111
France	54,000	172	29	5,500	2,250	258	6,231	6,292	3,212	3,115	5,148	5,127	1,715	1,785
Germany, Fed. Rep.	61,614	208	36	8,846	2,293	325	9,685	9,348	4,348	4,311	7,828	7,779	2,021	2,004
Greece	9,700	18	4	355	65	101	428	445	139e	155e	300	280	48	43
Ireland	3,200	2	0	50e	0	164	280e	280e	45	35	40	30	0	0
Italy	57,276	450	34	5,700	1,100	192	4,994	4,884	2,419e	2,194e	4,852	4,573	962e	818e
Netherlands	14,310	35	3	1,847	150	335*	2,198	2,160	718	626	1,683	1,633	162	136
United Kingdom	55,950	103	3	3,844	192	262	6,781e	6,680	1,696e	1,493	3,379	3,124	140	141
*Calculation on basis of nine months.														
EEC	271,070	1,010	115	27,385	6,580	282	32,830e	32,361	19,333e	12,689e	24,385	23,653	5,502	5,338
Finland	4,830	46	51	7,135	8,550	353	1,342	1,105	5,682	5,312	6,135	5,895	7,331	6,711
Norway	4,107	23	27	1,745	2,000	287	548	526	1,445	1,372	1,373	1,304	1,608	1,522
Sweden	8,300	57	59	6,860	9,625	445	1,693	1,682	5,791	5,323	6,136	5,928	8,529	7,706
Scandinavia	17,237	128	137	15,740	20,175	423	3,583	3,313	12,918	12,007	13,644	13,127	17,488	15,942
Austria	7,570	38	21	2,006	1,358	229	827	819	1,149	1,157	1,671	1,707	1,210	1,189
Iceland	234	0	0	0	0	198	21	21	0	0	0	0	0	0
Malta	350	0	0	0	0	157e	25e	25e	0	0	0	0	0	0
Portugal	10,088	95	8	700	1,000	112	504	506	464	451	571	583	895	852
Spain	37,833	207	34	3,130	1,665	159	2,631	2,879	1,423	1,451	2,588	2,684*	1,364	1,360
Switzerland	6,400	29	5	1,010	325	344	1,060	1,001	549	520e	920	887	296	296e
* Increase is partly through improved collection of production figures.														
Other W. Europe	62,475	367	68	6,846	4,348	185	5,088	5,251	3,585	3,579	5,750	5,861	3,785	3,797
Total W. Europe	350,782	1,503	320	49,971	31,103	258	41,481	40,925	30,836	28,255	43,779	42,841	26,735	15,077
Albania	2,750	4	4	10e	na	11e	13e	13e	8e	8e	8e	8e	8e	8e
Bulgaria	8,929	21	na	500	280	108	452	464	343	331	344	351	222	212
Czechoslovakia	15,520	49	24	1,282	1,031	168	1,543	1,181	977	976	1,225	1,249	880	960
German Dem. Rep.	16,732	21	19	na	na	179	1,350	1,355	791	802	1,248	1,261	679	678
Hungary	10,700	10	6	na	na	141	na	643	287	287	457	462	112	105
Poland	36,400	53	21	1,382	1,030	77	1,220	1,267	na	973	1,120	1,173	710	813
Romania	22,000	20	11	870e	na	71e	684e	613	930e	930e	805e	805e	815e	815e
USSR	270,000	84	57	10,200e	9,300e	73e	8,905	8,927	9,336	8,486e	8,955	9,077e	9,080	9,160e
Yugoslavia	22,740	30	21	1,350	825	112	1,169	1,143	638	840	1,199	1,190	724	749
E. Europe	405,771	292	183	15,594	12,466	88	15,336	15,677	12,569	13,642	15,361	15,576	13,210	13,500
Total Europe	756,553	1,795	483	65,565	43,569	185	56,817e	56,602	43,405e	41,897e	59,140	58,217	39,945	38,577
NORTH AMERICA														
Canada	24,600	107	34	15,269	23,165	386	4,853	4,310	12,821	11,264	13,603	12,406	19,285	16,988
United States	232,000	584	193	63,683	50,966	551	60,318	57,966	47,583	45,024	56,495	54,133	47,211	44,786
1 Per capita consumption of paper and board														
North America	256,600	691	227	78,952	74,131	538	65,171	62,276	60,404	56,288	70,098	66,539	66,496	61,774
ASIA														
Afghanistan	15,800	0	0	0	0	0	1e	1e	0	0	0	0	0	0
Bangladesh	91,000	7	8	163	152	2	75	84e	66	66e	70	79e	60	60e
Bahrain	4,000	0	0	0	0	17	3	3e	0	0	0	0	0	0
Bhutan	1,300	0	0	0	0	na	na	na	0	0	0	0	0	0
Brunei	2,000	0	0	0	0	11	1	1e	0	0	0	0	0	0
Burma	33,590	4	2	na	na	2	35	35e	12	17e	10	10e	12	17e
China, People's Rep.	1,015,410	1,800e	na	6,850	5,970	13e	5,917	5,900e	4,964	5,000e	5,400	4,890	4,310	4,582
Cyprus	600	0	0	0	0	191	52	52e	0	0	0	0	0	0
Hong Kong	5,200	3	0	30	0	265	534	531e	na	na	24	21e	na	na
India	663,000	175	330e	1,816	1,850	5	1,523	1,520	na	na	1,148	1,250	na	na
Indonesia	151,890	31	14	370	75	9	546	554e	205	229e	256	256e	115	139e
Iran	40,000	17	2	330	260	30	540	550e	179	179e	129	139e	100	100e
Iraq	13,000	2	2	144	90	4	65	52e	63	65e	28	15e	44	30e
Israel	4,082	4	0	155e	0	173	316	324e	63	65	127	128	0	0
Japan	118,693	593	87	22,844	12,182	322	16,797	17,345	10,205	10,313	16,980	17,453	8,612	8,627
Jordan	2,500	1	0	8	0	35	39	39	0	0	6	6	0	0
Kampuchea	8,900	0	0	0	0	2	6	6e	0	0	0	0	0	0
Korea, People's Rep.	19,000	6	2	100e	80e	11	88	88e	48	48e	80	80e	48	48e
Korea, Rep. of	39,331	170e	5	2,180e	314	93	1,640	1,660	742	671	1,783	1,737	222	235
Kuwait	1,400	1	0	24	0	117	66	75	0	5	0	5	0	0
Laos	3,800	0	0	0	0	1	1	1e	0	0	0	0	0	0
Lebanon	3,160	3	0	20e	0	53	109	109e	na	na	45	45e	0	0
Macao	3,000	0	0	0	0	81	11	11	0	0	0	0	0	0
Malaysia	14,400	13	0	75e	na	60	499	384e	4	4e	46	46e	4	4e
Mongolia	1,670	na	na	na	na	13	10	10e	2	2e	2	2e	2	2e
Nepal	14,600	1	na	2e	20e	2	10	10e	15	15e	2	2e	15	15e
Oman	900	0	0	0	0	12	5	5e	0	0	0	0	0	0
Pakistan	84,975	18	17	125	95	4	217	225	102	109	107	119	90	95
Philippines	50,700	13	11	433	348	15	431	385	179	143	325	261	154	105
Qatar	200	0	0	0	0	33	3	3e	0	0	0	0	0	0
Saudi Arabia	9,300	0	0	0	0	25	105	105e	0	0	0	0	0	0
Singapore	2,440	2	0	40e	0	148	na	na	na	na	na	na	na	na
Sri Lanka	14,800	2	2	38	26	4	66	23	28	22	24	22	20	20
Syria	8,980	3	0	6e	0	20	49	49e	0	0	3	3e	0	0
Taiwan	18,472	160	3	1,960	400	192	1,403	1,486	335	354	1,498	1,556	350*	293*
Thailand	48,775	34	8	458	220	25	527	538	169	166	394	413	69	99
Turkey	46,000	42	12	713	547	29	553	587	377	351	496	531	329	350
United Arab Emirates	9,000	0	0	0	0	na	na	na	0	0	0	0	0	0
Vietnam	52,300	55e	50e	100e	80e	11	54e	69e	56e	60e	50e	65e	31e	25e
Yemen Arab Rep.	5,400	0	0	0	0	na	na	na	0	0	0	0	0	0
Yemen Dem. Rep.	1,900	0	0	0	0	2	2	2e	0	0	0	0	0	0
*Market pulp only.														
Asia	2,625,633	2,967	535	39,034	22,627	28	32,299	32,822	17,818	17,870	28,033	30,134	14,581	14,886

na = not available, e = estimate

Note: The per capita figure is for consumption of paper and board in 1982. Some national editors have taken other factors into consideration, such as inventory; hence, production plus imports less exports is not always the same amount as noted above.

INDUSTRY AT A GLANCE

AUSTRALASIA

	Population (1,000)	Number of mills P&B	Pulp	Capacity (1,000 m tons)		Per Capita (lb)	Consumption (1,000 tons)				Production (1,000 m tons)			
				P&B	Pulp		1981	P&B	1982	1981	Pulp	1982	1981	Pulp
Australia	15,170	16	17	1,745	1,000	298	2,054	2,049	917	947	1,393	1,496	663	705
Fiji	600	0	0	0	0	31	9	9e	0	0	0	0	0	0
New Zealand	3,160	5	9	801	1,376	315	416	487	852	625	711	702	1,160	1,050
Papua New Guinea	3,600	0	0	0	0	4	5e	6e	0	0	0	0	0	0
Samoa	200	0	0	0	0	na	na	na	0	0	0	0	0	0
Australasia	22,730	21	26	2,546	2,376	247	2,485	2,545	1,589	1,572	2,104	2,198	1,823	1,755

LATIN AMERICA

	Population (1,000)	Number of mills P&B	Pulp	Capacity (1,000 m tons)		Per Capita (lb)	Consumption (1,000 tons)				Production (1,000 m tons)			
				P&B	Pulp		1981	P&B	1982	1981	Pulp	1982	1981	Pulp
Argentina	28,500	91	18	1,020	670	64	849	817	427	502	656	732	299	390
Bahamas	240	0	0	0	0	9	1	1e	0	0	0	0	0	0
Barbados	280	0	0	0	0	55	7	7e	0	0	0	0	0	0
Belize	143e	0	0	0	0	15e	10	10e	0	0	0	0	0	0
Bolivia	5,600	2	na	na	na	7	19	19e	1	1e	1	1e	1	1e
Brazil	124,000	160	48	4,000	3,990	57	3,233	3,246	2,172	2,115	3,297	3,244	2,910	2,912
Chile	11,487	18	7	384	799	42	324	220	357	189	319	258	744	668
Colombia	28,000	26	7	509	246	35	461	461e	254	254e	369	369e	204	204e
Costa Rica	2,600	2	1	18	28	110	122	106	5	7	12	13	5	7
Cuba	10,000	9	3	150	60	51e	232	232e	80	80e	73	73e	32	32e
Dominican Rep	5,551	2	0	45e	0	26	65	65e	4	4e	9	9e	0	0
Ecuador	8,380	9	5	62	32	24	94	99	44	48	54	54	24	26
El Salvador	5,500	3	0	40	0	31	46	52e	0	3	18	22	0	0
Guatemala	7,500	4	0	48	0	35	93	88e	30	5	48	43	0	0
Guyana	900e	0	0	0	0	17e	7	7e	0	0	0	0	0	0
Haiti	5,800	0	0	0	0	2e	6	6e	0	0	0	0	0	0
Honduras	4,000	0	0	0	0	36	70	65e	0	0	0	0	0	0
Jamaica	2,215	1	0	12e	0	46	46	46e	0	0	10	10e	0	0
Mexico	77,000	62	26	2,804	1,023	64	2,519	2,268	865	876	1,950	1,987	743	748
Neth Antilles	247e	0	0	0	0	27e	3	3e	0	0	0	0	0	0
Nicaragua	2,200	0	0	0	0	25	30	25e	0	0	0	0	0	0
Panama	2,100	3	0	28	0	90	78	80	0	0	18	21	0	0
Paraguay	3,117	3	0	na	0	18	26	26e	15e	15e	13	13	15e	15e
Peru	18,500	11	4	351	311	24	228e	197	154	110	197	145	103	75
Surinam	355	0	0	0	0	93e	14	15e	0	0	0	0	0	0
Trinidad/Tobago	1,200	0	0	0	0	57e	31	31e	0	0	0	0	0	0
Uruguay	2,900	12	5	60	28	37	71	49	30	23	51	43	23	21
Venezuela	16,459	12	3	650e	160	104e	728	780	233	283	488	540	63	63
Latin America	374,774	430	127	10,181	7,347	53	9,413	9,021	4,671	4,470	7,583	7,582	5,166	5,162

AFRICA

	Population (1,000)	Number of mills P&B	Pulp	Capacity (1,000 m tons)		Per Capita (lb)	Consumption (1,000 tons)				Production (1,000 m tons)			
				P&B	Pulp		1981	P&B	1982	1981	Pulp	1982	1981	Pulp
Algeria	20,000	6	3	155	107	24	70	81	31	na	95	100	31	31e
Angola	7,080	3	1	40e	44e	9	28e	28e	33e	33e	14e	14e	35e	35e
Benin	3,600	0	0	0	0	2	3	3e	0	0	0	0	0	0
Botswana	830	0	0	0	0	2	1	1e	0	0	0	0	0	0
Burundi	4,500	0	0	0	0	2	4e	4e	0	0	0	0	0	0
Cameroon	8,500	na	1	na	120	7	34e	29e	0	0	5e	5e	110e	100e
Central African Rep	2,290	0	0	0	0	1	1	1e	0	0	0	0	0	0
Chad	4,500	0	0	0	0	1	2	2e	0	0	0	0	0	0
Congo	1,550	0	0	0	0	2	1	1e	0	0	0	0	0	0
Egypt	42,300	15	3	170	80	13	320	270	71	73	136	133	39	44
Ethiopia	33,000	2	0	10e	0	2	17	17e	4	3e	7	5e	4	3e
Gabon	600	0	0	0	0	7	2	2e	0	0	0	0	0	0
Gambia	600	0	0	0	0	7	2e	2e	0	0	0	0	0	0
Ghana	11,750	0	0	0	0	1	2	3e	0	0	0	0	0	0
Guinea	5,300	0	0	0	0	2	4e	4e	0	0	0	0	0	0
Ivory Coast	8,000	0	0	0	0	10	35	35e	0	0	0	0	0	0
Kenya	17,000	4	na	66e	45e	9	68e	75e	0	10e	48e	55e	20e	20e
Lesotho	1,350	0	0	0	0	2	1e	1e	0	0	0	0	0	0
Liberia	1,870	0	0	0	0	5	4	4e	0	0	0	0	0	0
Libya	3,000	2	0	10e	0	11	16e	16e	0	0	6e	6e	0	0
Madagascar	9,000	1	2	28	5	7	10	9	5	6	10	9	5	6
Malawi	6,000	0	0	0	0	3	9	8e	0	0	0	0	0	0
Mali	6,900	0	0	0	0	0	1	1e	0	0	0	0	0	0
Mauritania	1,650	0	0	0	0	5	4e	4e	0	0	0	0	0	0
Mauritius	1,000	0	0	0	0	11	5	5e	0	0	0	0	0	0
Morocco	21,000	8	1	120	100	18	161	174	50	na	99	104	81	69
Mozambique	10,500	2	na	10e	na	4	23	23e	na	na	3	3e	na	na
Niger	5,350	0	0	0	0	0	1e	1e	0	0	0	0	0	0
Nigeria	85,000	3	3	14	na	4	141	144	5	na	14	14	0	0
Rwanda	5,000	0	0	0	0	1	2	2e	0	0	0	0	0	0
Senegal	5,660	0	0	0	0	4	23	23e	0	0	0	0	0	0
Sierra Leone	3,500	0	0	0	0	1	2e	2e	0	0	0	0	0	0
Somalia	3,700	0	0	0	0	0	1e	1e	0	0	0	0	0	0
South Africa	24,000	16	10	1,320	1,190	121	1,325	1,281	1,044	989e	1,288	1,301	1,122	1,165
Sudan	28,300	3	0	na	0	2	13e	13e	3e	3e	3e	3e	0	0
Swaziland	605	0	1	0	17e	4	1	1	2	1	0	0	159	170
Tanzania	17,500	1	0	4	0	2	23e	23e	0	0	3	3	0	0
Togo	2,600	0	0	0	0	5	6	6e	0	0	0	0	0	0
Tunisia	6,300	5	1	34	24	22	69	75	10	8	36	29	12	18
Uganda	13,250	1	0	3e	0	2	7e	7e	0	0	2e	2e	0	0
Upper Volta	6,900	0	0	0	0	1	2e	2e	0	0	0	0	0	0
Zaire	28,100	1	0	na	0	1	9e	9e	0	0	1e	1e	0	0
Zambia	6,100	1	1	16	14e	1	33	33e	0	7	16	16e	0	0
Zimbabwe	7,500	3	1	550e	25e	24	86e	74e	26e	26e	57e	45e	20e	20e
Africa	483,035	77	28	2,250	1,924	12	2,572	2,500	1,284	1,159	1,843	1,848	1,848	1,698
WORLD TOTAL	4,519,325	5,971	1,426	198,528	151,974	82	188,757	185,768	130,497	124,804	189,809	186,518	130,902	125,085

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PULP & PAPER AUGUST 1983

Price's new newsprint machine at Iroquois Falls, Ont., which replaces four older units.

Investment has slowed somewhat in the U.S. as well. American Paper Institute has forecast a 1.7%/year increase in paper and board capacity through 1985.

The first half of 1983 has been generally positive, and the consensus is that a sustained economic recovery is underway with real GNP expected to rise by 3% in the U.S. The recovery of export markets may be somewhat slower, particularly in view of increased competition from relatively new suppliers such as Brazil in market pulp and South Africa in newsprint.



EUROPE

THE LONG-AWAITED recovery never really ma-

terialized in 1982, as the Western European economies stagnated in recession most of the year. Only toward the end of the year was a slight upturn noted, fueled largely by the start of the recovery in the U.S. European unemployment continued at high levels—actually rising through the year in many countries—and austerity measures were put into effect by many governments.

The effect of the devaluations, particularly those in the Nordic countries, has been to shift the competitive production cost advantage from North America back to these countries for market pulp and, to some extent, for linerboard and other grades. This has interesting implications for the European market in 1984, when the last remaining tariff barriers for paper/board imports from

Nordic countries into the EEC will have been removed.

Production of paper and board in Western Europe dropped by almost 1 million metric tons in 1982, to about 42.7 million tons, while output of pulp (both chemical and mechanical) fell even more sharply—by over 2 million tons, or 9.2%, to 25.1 million tons. This heavy dropoff largely reflects the cutback in market pulp production in the Nordic countries.

Output in Eastern Europe, including Yugoslavia, recorded a modest increase for paper and board—up about 1.3% to 15.6 million tons. U.S.S.R., Czechoslovakia, Poland, and Dem. Rep. Germany all reported production increases. Total Eastern European pulp output also rose, up by 2.2% to 13.5 million tons. The completion of major investments in Czechoslovakia, Poland, and U.S.S.R. should assure continued capacity and production increases for 1983 and 1984.

Upturn in Britain? The recent recession provoked the closure of many mills in Europe, particularly within EEC, and quite a few took place in 1982. Hardest Most heavily hit by closures during the past few years has been the U.K., and the continuing decline in paper/ and board production—to just under 3.2 million tons in 1982—reflects the British industry's retrenchment to a core of viable operations.

However, according to some observers, the bottom may have been reached in the U.K. and a turnaround of at least modest proportions could be underway. Of major importance is the restart, in mid-1983, of the former Bowater Ellesmere Port newsprint mill under the new ownership of Consolidated-Bathurst of Canada. By end-1983 this operation should be producing about 275,000 tpy of newsprint. Further, the Finnish producer, United Paper Mills Ltd., early this year announced plans for a new newsprint mill in northern Wales, due to start up in

France

Population: 54,000,000. Per capita consumption of paper and board: 115 kg/258 lb. Number of paper and board mills: 172. Number of pulp mills: 29 (sulfate: 8; sulfite: 4; semichemical: 7; mechanical: 16).

Paper/board capacity: 5,500,000 tons

Pulp capacity: 2,250,000 tons

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	3,170	3,180	1,425	1,425	844	821
Board	1,978	1,947	749	809	245	245
Total	5,148	5,127	2,174	2,234	1,089	1,066
Chemical woodpulp	1,301	1,342	1,585	1,461	149	167
Other pulps	414	423	66	58	4	2
Total	1,715	1,765	1,651	1,519	153	169

Fed. Rep. of Germany

Population: 61,614,000. Per capita consumption of paper and board: 152 kg/335 lb. Number of paper and board mills: 208. Number of pulp mills: 36 (sulfite: 11; semichemical: 1; mechanical: 24).

Paper/board capacity: 8,846,000 tons
Operating rate 1982: 88%

Pulp capacity: 2,293,000 tons
Operating rate 1982: 87%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	5,141	5,119	2,608	2,486	1,296	1,389
Board	2,687	2,660	1,124	1,086	646	679
Total	7,828	7,779	3,732	3,572	1,942	2,068
Chemical woodpulp	811	792	2,344	2,341	111	96
Other pulps	1,210	1,212	80	64	—	—
Total	2,021	2,004	2,424	2,405	111	96

Italy

Population: 56,276,000. Per capita consumption of paper and board: 87 kg/191 lb. Number of paper and board mills: 450. Number of pulp mills: 34 (sulfite: 2; semichemical: 5; mechanical: 17; nonwood: 10).

Paper/board capacity: 5,700,000 tons
Operating rate 1982: 80%

Pulp capacity: 1,100,000 tons
Operating rate 1982: 74%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	2,869	2,572	621	672	650	618
Board	1,983	1,999	342	428	170	170
Total	4,852	4,571	963	1,100	820	788
Chemical woodpulp	189	188	1,529	1,269	12	19
Other pulps	773	628	72	90	—	—
Total	962	816	1,601	1,359	12	19

Japan

Population: 118,693,000. Per capita consumption of paper and board: 146 kg/322 lb. Number of paper and board mills: 593. Number of pulp mills: 67 (sulfate: 37; sulfite: 3; semichemical: 12; nonwood: 1).

Paper/board capacity: 22,844,000 tons
Operating rate 1982: 76%

Pulp capacity: 12,182,000 tons
Operating rate 1982: 71%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	9,944	10,353	223	351	359	411
Board	7,037	7,099	265	278	314	329
Total	16,981	17,452	488	629	673	740
Chemical woodpulp	6,272	6,508	1,176	1,274	103	66
Other pulps	2,339	2,118	522	479	1	3
Total	8,611	8,626	—	1,753	104	69

1985 and to produce 160,000 tpy.

Fed. Rep. Germany is the largest paper producer in Western Europe. Despite a slight drop in 1982 output to 7.8 million tons, FRG increased its lead over **Sweden** (5.93 million tons) in second place and **Finland** (5.90 million tons) in third place. Preliminary statistics indicate FRG output should top the 8-million-ton mark this year for a new record.

International trade issues. The EEC investigation of an alleged pulp supply cartel, which began last year, resulted in issuance of a recommendation in April 1983 that, among other things, called for pricing of market pulp in either the producer's or the buyer's currency. This suggestion has met strong opposition from many producers and major pulp buyers, and by end-June there had been no formal resolution of the issue. EEC authorities had offered, as part of the package, to drop their antitrust investigation if the new pricing arrangement were put into effect.

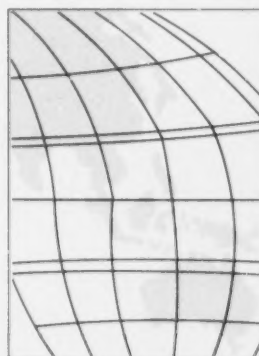
Also on the international trade front, the last step in phaseout of customs duties on paper and board into the EEC from EFTA countries, set for January 1984, has led to critical negotiations on the duty-free quota ceilings for Canadian newsprint. The outcome is of vital importance to the future of the hard-pressed eastern Canadian newsprint industry.

Cautious optimism. The general mood in the European industry today is one of cautious optimism that the current recovery will be maintained during the rest of 1983 and 1984. The sharp pickup in volume during the early part of 1983 has slowed somewhat, and price development has not been as rapid as had originally been hoped, due in part to the effects of the currency realignments. As a result, overall profitability will not be very satisfactory in continental Europe. The Nordic pro-

ducers, however, stand to benefit from their countries' devaluations, and interim profit figures already are quite attractive for many companies.

The rate of capital investment in new production capacity appears to have slowed. According to a recent survey (PPI's "Capital Investment Survey 1983-86"), about 2.9 million tons of new paper/board capacity will be added by end-1986 from "confirmed" projects, with another 700,000 tons in projects "in advanced planning stage." This represents a decline of around 10% in the "confirmed" tonnage reported last year for the 1982-85 period, and more than a 50% falloff in the "advanced planning stage" category.

Corresponding figures for new pulp capacity are 2.5 million tons for Europe in all project categories in the 1983 survey, compared to 1982's almost 3.3 million tons.



ASIA/ AUSTRAL- ASIA

DESPITE GENERALLY depressing reports on paper industry performance in 1982 from many countries, Asia's paper and board production was just over 30 million metric tons, a rise of 4% from 1981 levels. Pulp output also registered an increase (a

Korea

Population: 39,331,000. Per capita consumption of paper and board: 42 kg/93 lb. Number of paper and board mills: 170e. Number of pulp mills: 5 (sulfate: 1; mechanical: 4).

Paper/board capacity: 2,180,000e tons
Operating rate 1982: 83%

Pulp capacity: 314,000 tons
Operating rate 1982: 77%

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	899	893	22	25	105	70
Board	885	844	13	12	76	45
Total	1,784	1,737	35	37	181	115
Chemical woodpulp	85	108	447	377	—	—
Other pulps	137	127	74	59	—	—
Total	222	235	521	436	—	—

Mexico

Population: 77,000,000e. Per capita consumption of paper and board: 29 kg/64 lb. Number of paper and board mills: 62. Number of pulp mills: 26 (sulfate: 11; sulfite: 1; mechanical: 1; nonwood: 13).

Paper/board capacity: 2,804,000 tons
Operating rate 1982: 71%

Pulp capacity: 1,022,500 tons
Operating rate 1982: 73%

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	1,075	1,123	461	208	—	—
Board	875	864	108	73	—	—
Total	1,950	1,987	569	281	—	—
Chemical woodpulp	408	400	76	75	—	—
Other pulps	335	348	46	53	—	—
Total	743	748	122	128	—	—

Netherlands

Population: 14,310,000. Per capita consumption of paper and board: 152 kg/335 lb. Number of paper and board mills: 35. Number of pulp mills: 3 (mechanical: 2; nonwood: 1).

Paper/board capacity: 1,847,000 tons
Operating rate 1982: 88%

Pulp capacity: 150,000 tons
Operating rate 1982: 91%

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	863	801	945	921	484	447
Board	820	832	450	465	396	403
Total	1,683	1,633	1,395	1,386	880	850
Chemical woodpulp	—	—	515	n.a.	3	n.a.
Other pulps	162	136	50	n.a.	1	n.a.
Total	162	136	560	499	4	9

New Zealand

Population: 3,160,000. Per capita consumption of paper and board: 143 kg/315 lb. Number of paper and board mills: 5. Number of pulp mills: 6 (sulfate: 2; semichemical: 2; mechanical: 5).

Paper/board capacity: 801,290 tons
Operating rate 1982: 88%

Pulp capacity: 1,375,576 tons
Operating rate 1982: 76%

	(000 metric tons)					
	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	510	478	41	46	315	222
Board	210	224	—	—	21	38
Total	701	702	41	46	336	260
Chemical woodpulp	619	587	6	15	245	227
Other pulps	541	473	—	1	269	214
Total	1,160	1,060	6	16	514	441

modest 1.9%) to reach 14.9 million tons. Global economic recession was most frequently blamed for an increase in paper imports—which were often sold at prices undercutting domestic paper—and for sluggish investment in new projects.

Four of the five countries producing more than 1 million tpy of paper and board reported increased output in 1982: **Japan**, up 2.8% to 17.5 million tons; **People's Rep. of China**, up 9% to 5.89 million tons; **India**, up nearly 9% to 1.25 million tons; **Taiwan**, up 4% to 1.56 million tons. But **Rep. of Korea**, for the first time in the industry's history, recorded a drop in annual output, down 2.6% to 1.74 million tons. This was largely due to bankruptcies of several paper producers. The survivors, due to reduced overall capacity, generally had a more successful year than in 1981.

Japan's rebuilding continues. The long process of reorganization of the **Japanese** paper industry continued in 1982. It centers on reducing overcapacity and countering the pressure of imports (paper and board imports, mostly newsprint, increased by nearly 30% in 1982). Several key company mergers also took place in 1982. The need for reorganization was emphasized by the Ministry of International Trade & Industry when it revised downward its forecast for average annual growth in demand for 1981-90, from 3.5% to 2.5%.

Several "firsts" were announced during 1982. These included the first paper production in **Kuwait**, with startup of the Gulf Paper mill (5,000 tons of tissue and other papers). In the **Philippines**, Menzi Development Corp. plans to build the first banknote/security papers line in the ASEAN countries. In **Malaysia**, the first twin-wire tissue machine in Southeast Asia is being installed by Scott Paper's local subsidiary.

Project realism. One result of the recession is a much tighter control on capital investment by Asian govern-

ments and companies alike, with the result that although the number of proposed projects has fallen overall, those which remain are more certain of realization.

Indonesia is going ahead with two kraft paper and board mills, one of which has a World Bank loan. Georgia-Pacific of the U.S. has a 25% interest in the other. Also, a 200,000-tpy newsprint mill is due for 1984 startup in east Java.

The **Malaysian** government appears to have decided to favor just one of the two major projects which had been proposed for the country. It is expected to go ahead with an integrated mill in Kelantan rather than the 150,000-tpy integrated printing/writing mill in Sabah.

People's Rep. of China plans at least 12 major expansions at paper mills, most of them firm projects scheduled for startup in 1984-85. The Chinese industry was in contact in 1982 with major machinery and computer-control suppliers. Also, a delegation from the Chinese pulp and paper industry visited Canada and Latin America during the year, looking at possible investment opportunities.

Turkey's paper industry should see no fewer than seven mill expansion programs completed in 1983-84, three of them at tissue mills.

Australasia. The drop in demand, both domestic and overseas, in 1982 plus competition from cheap imports affected output and shipments in both **Australia** and **New Zealand**. Total paper and board production for the two countries was 2.2 million tons, up 4.5% from 1981, but pulp output dropped to 1.76 million tons, down 3.7%. This was mainly due to the 28% drop in New Zealand's market pulp production. New Zealand's paper and board output also declined marginally and included a 10% drop in newsprint and wrapping paper grades.

Australia's paper industry fared better in 1982, with newsprint output increasing by 50% following the 1981

Norway

Population: 4,107,000. Per capita consumption of paper and board: 130 kg/287 lb. Number of paper and board mills: 23. Number of pulp mills: 27 (sulfate: 2; sulfite: 4; semichemical: 2; mechanical: 19; nonwood: 4).

Paper/board capacity: 1,745,000 tons
Operating rate 1982: 75%

Pulp capacity: 2,000,000 tons
Operating rate 1982: 71%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	1,233	1,170	80	107	924	898
Board	140	134	110	97	91	84
Total	1,373	1,304	190	204	1,015	982
Chemical woodpulp	697	642	280	219	255	210
Other pulps	911	880	3	3	191	162
Total	1,608	1,522	283	222	446	372

Portugal

Population: 10,088,200. Per capita consumption of paper and board: 51 kg/112 lb. Number of paper and board mills: 95. Number of pulp mills: 8 (sulfate: 5; sulfite: 2; soda: 1).

Paper/board capacity: 700,000 tons
Operating rate 1982: 83%

Pulp capacity: 960,000 tons
Operating rate 1982: n.a.

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	390	370	46	47	21	21
Board	181	216	30	34	122	137
Total	571	586	76	81	143	158
Chemical woodpulp	853	909	23	13	455	521
Other pulps	42	43	1	7	0	0
Total	895	952	24	20	455	521

Romania

Population: 22,000,000. Per capita consumption of paper and board: 32e kg/72 lb. Paper and board mills: 20. Pulp mills: 11 (sulfate: 6; sulfite: 3; semichemical: 1; mechanical: 1; nonwood: 4).

Paper/board capacity: 870,000 tons

Pulp capacity: 850,000 tons

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	305	305	na	na	na	na
Board	500	500	na	na	na	na
Total	805	805	46	46	167	167
Chemical woodpulp	645	645	na	na	na	na
Other pulps	170	170	na	na	na	na
Total	815	815	134	134	10	10

South Africa

Population: 24,000,000. Per capita consumption of paper and board: 55 kg/121 lb. Number of paper and board mills: 16. Number of pulp mills: 10 (sulfate: 2; sulfite: 1; soda: 1; semichemical: 2; mechanical: 2; nonwood: 2).

Paper/board capacity: 1,320,000 tons

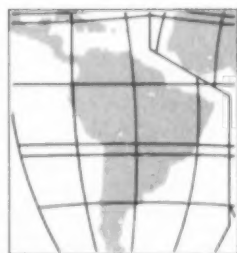
Pulp capacity: 1,190,000 tons

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	721	748	174	158	135	171
Board	565	553	80	81	39	36
Total	1,286	1,301	254	239	174	207
Chemical woodpulp	433	460	207	216	23	30
Other pulps	639	704	0	0	363	363
Total	1,122	1,165	207	216	386	393

startup of Australian Newsprint Mills' new Albury newsprint mill. However, printing/writing and packaging grades suffered from cheaper imported products.

Key event in 1982 in **New Zealand** was the purchase of Crown Zellerbach Canada by Fletcher Challenge. Among other developments were the startup of the Te Papapa 20,000-tpy corrugating medium mill by New Zealand Forest Products, and an advance in the proposal for a new 125,000-tpy newsprint line to be added to Winstone Samsung's Karioi pulp mill.

In Australia, developments included a takeover bid by North Broken Hill Holdings for Associated Pulp & Paper Mills; a decision by APPM and its Japanese partners to shelve plans for a 230,000-tpy kraft pulp mill in Tasmania; and a major salvage operation in about 20,000 acres of pine plantations following major fires in South Australia and Victoria in early 1983.



LATIN AMERICA

THE DEPTH AND LENGTH of the recession fell particularly hard on Latin American nations in 1982 because of the heavy foreign debts of several major countries—**Brazil**, **Mexico**, and **Chile**, in particular. The strength of the U.S. dollar and—for Mexico and Venezuela—the drop in interna-

tional oil prices and consumption led to critical debt-rescheduling measures during the past 12 months.

Severe austerity measures were imposed by several governments, partly in response to these debt-rescheduling agreements and the conditions requested by international lending organizations. This, in turn, tended to depress domestic demand for consumer goods, which had a negative effect on paper and board consumption.

Despite this uncomfortable economic situation, total Latin American paper and board production in 1982 rose marginally (0.9%) to 7.6 million metric tons. **Argentina** accounted for much of the increase with an 11.6% jump in output to 732,000 tons, with **Venezuela** not far behind (10.6% increase to 540,000 tons). Modest improvements were also recorded in Mexico (up 1.9% to 1.99 million tons). Small declines were reported in Brazil and **Peru**, and an almost 20% falloff in **Chile's** output.

But **Brazil** had a bright spot in the success of its pulp and export markets. During most of the recession, the major pulp mills were able to run at virtually full capacity, and in 1982 Brazil's market pulp exports rose almost 7% to 810,000 tons.

Capital investments. Several key capital spending projects were completed in late 1982 or early this year: the Alto Parana 172,000-tpy bleached softwood kraft market pulp mill and Papel del Tucuman's 107,000-tpy bagasse newsprint mill in **Argentina**; the addition of a bleach line to Riocell's existing eucalyptus kraft pulp mill in **Brazil**; **Cuba's** 70,000-tpy Jatibonico integrated bagasse pulp and paper mill; and Kimberly-Clark de Mexico's new 45,000-tpy tissue mill at San Juan del Rio.

Among major projects nearing completion are the Papel de Imprensa 116,000-tpy newsprint mill and Champion Papel e Celulose's new 95,000-tpy free-sheet paper machine in Brazil; and the Celulosa de **Guatemala** (Cel-

Spain

Population: 37,980,000. Per capita consumption of paper and board: 74 kg/163 lb. Number of paper and board mills: 203. Number of pulp mills: 33 (sulfate: 13; sulfite: 1; semichemical: 1; mechanical: 10; nonwood: 8).

Paper/board capacity: 3,155,000 tons
Operating rate 1982: 85%

Pulp capacity: 1,670,000 tons
Operating rate 1982: 90%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	1,421	1,430	261	342	194	197
Board	1,167	1,255	90	119	114	140
Total	2,588	2,685	351	461	308	337
Chemical woodpulp	1,021	1,040	237	259	174	151
Other pulps	333	310	4	1	9	18
Total	1,354	1,350	241	260	183	169

Sweden

Population: 8,300,000. Per capita consumption of paper and board: 202 kg/445 lb. Number of paper and board mills: 57. Number of pulp mills: 59 (sulfate: 26; sulfite: 10; semichemical: 2; mechanical: 21).

Paper/board capacity: 6,860,000 tons
Operating rate 1982: 86%

Pulp capacity: 9,625,000 tons
Operating rate 1982: 80%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	3,936	3,567	124	132	2,918	2,544
Board	2,200	2,361	55	52	1,704	1,186
Total	6,136	5,928	179	184	4,622	4,430
Chemical woodpulp	6,531	5,867	68	74	2,436	2,107
Other pulps	1,998	1,839	10	18	380	368
Total	8,529	7,706	78	92	2,816	2,475

Taiwan

Population: 18,472,000. Per capita consumption of paper and board: 81 kg/179 lb. Number of paper and board mills: 160. Number of market pulp mills: 3 (sulfate: 1; nonwood: 2).

Paper/board capacity: 1,960,000 tons
Operating rate 1982: 79%

Pulp capacity: 400,000 tons
Operating rate 1982: 73%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	532	514	55	85	31	41
Board	966	1,042	21	13	129	127
Total	1,498	1,556	76	98	171	168
Chemical woodpulp	257	207	80	128	87	59
Other pulps	93	86	4	4	12	13
Total	350	293	84	132	99	72

United Kingdom

Population: 55,950,000. Per capita consumption of paper and board: 119 kg/262 lb. Number of paper and board mills: 103. Number of pulp mills: 3 (semichemical: 2; mechanical: 1).

Paper/board capacity: 3,844,000 tons
Operating rate 1982: 83%

Pulp capacity: 192,000 tons
Operating rate 1982: 73%

	Production		Imports		Exports	
	1981	1982	1981	1982	1981	1982
Paper	1,847	1,674	n.a.	106	n.a.	185
Board	1,532	1,450	n.a.	n.a.	n.a.	n.a.
Total	3,379	3,124	n.a.	3,955	n.a.	390
Chemical woodpulp	50	80	1,351	1,219	n.a.	n.a.
Other pulps	90	61	205	131	n.a.	2
Total	140	141	1,556	1,350	n.a.	2

gusa) 100,000-tpy bleached softwood kraft market pulp mill.

It is hoped that the generally more favorable worldwide economic climate will bring recovery this year and next, with stable oil prices and a decline in inflationary pressures.



AFRICA

AFRICAN PAPER AND BOARD production in 1982 increased (by a mere 0.3%) from 1981 to a total of 1.85 million metric tons. Pulp output did slightly better, with a 3% increase to 1.7 million tons. The almost static production figures,

plus a decrease in the number of proposed new expansion projects, were largely blamed on worldwide economic recession. Of the 19 African nations which have papermaking facilities, only four recorded a production increase in 1982 over 1981. Six of the 13 pulp-producing countries raised their annual output from the previous year.

Africa's pulp and paper output is dominated by **South Africa**, which produces twice as much as the rest of Africa put together. The fact that South Africa's 1982 paper and board output increased by only 1%, to 1.3 million tons, heavily affected the continent's total figures. South Africa's lead over other African nations will be further

increased when several massive expansion projects are completed in the next two years.

These will make South Africa a major competitor in the international newsprint, linerboard and pulp markets. It is already exporting substantial newsprint tonnage. The rapid rise in newsprint production and exports in the last three years provides an indication of what is to come; in 1981, newsprint output leaped 35% and exports 53% from 1980; in 1982, output was up another 20% and exports increased by 30%. South Africa can also be expected to move up from its No. 14 position on the top world pulp producers table when Sappi's Ngodwana expansion and Mondi's 500,000-tpy Richards Bay kraft pulp mill are completed by end-1984. Mondi alone expects its new mill to generate annual export sales worth \$115 to \$140 million.

But it is not all good news. South African companies suffered like many others from the weak export markets throughout 1982. Not only export sales were affected; there were also reports of imported paper being sold at "dumping prices," undercutting domestic product.

Project possibilities. In two other countries a series of new mills and machine rebuilds is being carried out. The three **Nigerian** projects have been plagued by lack of funding from the government, but now two of them—one of which is a 100,000-tpy newsprint mill—are nearly complete. However, it is still impossible to set reliable startup dates, again because of shortages of funds.

Two of the main modernization programs for the **Egyptian** industry—by Rakta and National Paper—should be completed by mid-1984. A new bagasse-based newsprint mill and a small tissue mill are other projects moving out of the planning stages and into construction.

Other African projects which seem likely to be completed include Panafrican Paper's integrated mill at **Kenya**, which will add 15,000-tpy of printing/writing capacity and is due to start in early 1984. In **Tanzania**, Southern Paper Mill's project for an integrated 60,000-tpy mill producing printing/writing and kraft paper and board is also scheduled to start up in early 1984.

Another project which is a long way from startup but which still could go ahead is the 250,000-tpy bleached kraft pulp mill at Pointe Noire in **People's Rep. of Congo**. The project has attracted attention because of the claimed dramatic yield rate of the eucalyptus plantations being grown specifically to supply the mill. In 1982, the yield was put at a staggering 40 m³/hectare. An international syndicate, SECC, which includes Billerud of Sweden, is reported to be investigating project feasibility. Despite advice against it, the Congolese government seems determined to go ahead with the mill project. ■

United States

Population: 232,000,000. Per capita consumption of paper and board: 250 kg/551 lb. Number of paper and board mills: 584. Number of pulp mills: 193 (sulfate: 122; sulfite: 21; semichemical: 37; mechanical: 47).

Paper/board capacity: 63,683,000 tons **Pulpcapacity:** 50,966,000 tons
Operating rate 1982: 88% **Operating rate 1982:** 32%

	Production		(000 metric tons)		Exports	
	1981	1982	Imports	1982	1981	1982
Paper	28,161	27,574	7,332	7,032	936	781
Board	28,333	26,558	120	106	2,683	2,524
Total	56,494	54,132	7,442	7,138	3,619	3,305
Chemical woodpulp	42,385	40,161	3,564	3,186	3,330	3,075
Other pulps	4,826	4,625	144	131	7	5
Total	47,211	44,786	3,708	3,317	3,337	3,080

U.S.S.R.

Population: 270,000,000. Per capita consumption of paper and board: 33e kg/73 lb. Number of paper and board mills: 84. Number of pulp mills: 57.

Paper/board capacity: 10,200,000e tons **Pulp capacity:** 10,390,000e tons

	Production		(000 metric tons)		Exports	
	1981	1982	Imports	1982	1981	1982
Paper	5,401	5,522	730	690	670	730
Board	3,555	3,555	270	270	380	380
Total	8,956	9,077	1,000	960	1,050	1,110
Chemical woodpulp	7,160	7,260	271	271	955	955
Other pulps	1,900	1,900	0	0	0	0
Total	9,060	9,160	271	271	955	955

Further data on world's paper industry

Detailed data on world production, consumption, and pulp and paper industry economics is available in the 1983 Review Number published by our associate magazine, *Pulp & Paper International* (publication date July 25, 1983). Copies of this issue, which include individual reports for all producing countries, are \$20 each.

To order, send payment (US\$) to: *PPI*, Circulation Dept., 500 Howard St., San Francisco, Calif. 94105

Chlorate demand to increase slightly in 1983

By BARRY SHOCKETT

The 1982 recession, which reduced demand for most chemicals and increased imports from Canada, resulted in a 30,000-ton drop in domestic sodium chlorate production, even though total demand was off only 5,000 tons.

Canadian producers are in slightly better shape due to a stronger export market, and production should increase 6% to 7%.

SODIUM CHLORATE

UNITED STATES

Uses: Pulp mills use most of the sodium chlorate for onsite generation of chlorine dioxide. Other uses are: chemical intermediate, uranium production, and agriculture.

Demand: Chlorine dioxide generation consumes about 82% of total NaClO_3 demand. In 1982, pulp mills consumed an estimated 279,000 tons of NaClO_3 , out of a total of 340,000 tons. This should increase to about 290,000 tons in 1983. In 1982, imports rose 11,000 tons over 1981, to 86,000 tons, and should increase 8,000 tons in 1983.

Sources: The major chlorate producers include Erco Industries, Georgia-Pacific, Kerr-McGee, Occidental Chemical, Olin, and Pennwalt. Smaller facilities are operated by Brunswick Chemical, Huron Chemicals, and Pacific Engineering. In addition, imports from Canada continue to play an increasing role in the U.S. market place.

Availability: With operating rates remaining low and imports on the rise, supplies will remain adequate. 1982, market; 1981, market; 1980, market.

Pricing: An attempt was made last summer by most producers to remove the \$45/ton discount off the \$420/ton list, but the soft economy in the second half of 1982 caused the selling price to revert to \$375/ton. The discounted price remained in effect in the first

U.S. statistics, sodium chlorate (000 short tons)

	1980	1981	1982	1983e
Nameplate capacity	388	388	400	405
Production	278.4	280.5	250	260
Shipments	266.1	270	255	260
Imports	56.7	75.5	86	94.5
Exports	1.3	0.6	0.5	0.5
Apparent consumption	321.5	345	340.5	354.5
Pulp bleaching	263.5	283	279	299
Miscellaneous*	58	62	61.5	64

*Includes other chlorates, uranium, agriculture, and others.
Source: Bureau of Census, U.S. Dept. of Commerce.

Canadian statistics, sodium chlorate (000 short tons)

	1980	1981	1982	1983e
Nameplate capacity	314	338	400	425
Production	269.5	281	291	310
Shipments	274	281	278	310
Imports	1.2	1.4	2.2	2.2
Exports	56.2	75.5	86	94.5
Domestic demand	219	207	194	217.5
Pulp bleaching	209.5	197	183	205
Other*	9.5	10	11	12.5

*Includes uranium, agchems, and others.

half of 1983, although one producer tried to boost the off-list price by \$30/ton. List prices are still \$420/ton, and are not expected to change in 1983. As the economy improves, the discount should decrease. 1982, \$420/ton; 1981, \$375/ton; 1980, \$345-\$375/ton.

Forecast: Sodium chlorate pulp mill usage is not expected to rise more than 4% this year. Imports from Canada are likely to continue to increase.

CANADA

Uses: Most NaClO_3 produced, either captively or for merchant sales, is employed by kraft pulp mills for onsite generation of chlorine dioxide used in pulp bleaching. Other uses: uranium processing and agchems.

Demand: Pulp mills used about 183,000 tons in 1982 (about 95% of the total) a drop of 7% for 1981 due to weak pulp production. In 1983, demand should increase to 205,000 tons.

Sources: Major merchant producers are: Canadian Occidental, Erco Industries, QueNord, and PPG Industries' Stanchem Div. New producer BCM

Technologies postponed its onstream date to this summer, and all its output will be exported to the U.S. market. Three more small plants closed in 1981, and the remaining captive producers are BC Chemicals, St. Anne Chemical, and Saskatoon Chemicals.

Availability: Canadian capacity increased 62,000 tons in 1982 and will go up 25,000 tons this year and 26,000 tons in 1984. This will ensure an adequate supply for domestic mills. 1982, market; 1981, market; 1980, market.

Pricing: List prices increased at the beginning of 1983 to \$435/ton from the \$410/ton price at the end of 1982. However, due to depressed market pulp mill demand, list prices were discounted about \$25/ton. The discount will probably be removed when markets improve. History: 1982, \$410/ton; 1981, \$365/ton; 1980, \$310-\$330/ton.

Forecast: As the economy revives, companies will implement postponed ClO_2 generation projects, and pulp mill chlorate demand will increase 8.0%/year.

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